

Abstract

A filter such as a cigarette filter having a metal reagent which selectively binds with a gaseous component of a gas stream such as tobacco smoke. The metal reagent comprises nanometer or micrometer size clusters of a transition metal or alloy containing a transition metal. The transition metal can be incorporated in an intermetallic compound such as titanium aluminide or iron aluminide. The metal clusters can be incorporated in or on a support material such as silica gel, porous carbon or a zeolite. The metal reagent can remove the gaseous component by selectively binding to unsaturated hydrocarbons such as 1,3-butadiene. The binding can occur by insertion of a metal atom of the metal reagent into a C-H bond or a C-C bond of the gaseous component.